/ /

PCT

ENTERED

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    3  <110> APPLICANT: JEFFERSON, RICHARD
    4        MAYER, JORGE E.
    6  <120> TITLE OF INVENTION: MICROBIAL BETA-GLUCURONIDASE GENES, GENE PRODUCTS AND
    7        USES THEREOF
    9  <130> FILE REFERENCE: 076518-0150
   11  <140> CURRENT APPLICATION NUMBER: 09/936,759
C-->12  <141> CURRENT FILING DATE: 2002-04-22
   14  <150> PRIOR APPLICATION NUMBER: PCT/US00/07107
   15  <151> PRIOR FILING DATE: 2000-03-16
   17  <150> PRIOR APPLICATION NUMBER: 09/270,957
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   24  <151> PRIOR FILING DATE: 1997-09-09
   26  <160> NUMBER OF SEQ ID NOS: 120
   28  <170> SOFTWARE: PatentIn Ver. 2.1
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   32  <212> TYPE: DNA
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   35  <400> SEQUENCE: 1
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   38  taataacatg taaccactta catttaaaaa ggagtgctat catgttatat ccaatcaata 180
   39  cagaaacccg aggagttttt gatttaaatg gggtctggaa ttttaaatta gattacggca 240
   40  aaggactgga agaaaagtgg tatgaatcaa aactgacaga taccatatca atggctgtac 300
   41  cttcctccta taatgatatc ggtgttacga aggaaattcg aaaccatatc ggctatgtat 360
   42  ggtacgagcg tgaatttacc gttcctgctt atttaaaaga tcagcgcatc gtcctgcgtt 420
   43  ttggttcagc aacacataag gctattgtat acgttaacgg agaactagta gttgaacaca 480
   44  aaggcggctt cttaccgttt gaggcagaaa taaacaacag cttaagagac ggaatgaatc 540
   45  gtgtaacagt agcggttgat aatattttag atgattctac gctcccagtt gggctatata 600
   46  gtgaaagaca tgaagaaggt ttgggaaaag tgattcgtaa taaacctaat tttgacttct 660
   47  ttaactatgc aggcttacat cgtcctgtaa aaatttatac accccttttt acctatgttg 720
   48  aggatatatc ggttgtaacc gattttaacg gtccaacggg aacagttacg tatacagttg 780
   49  attttcaggg taaggcagaa accgtaaagg ttagtgtagt tgatgaagaa gggaaagttg 840
   50  ttgcttcaac tgaaggcctc tctggtaatg ttgagattcc taacgttatc ctttgggaac 900
   51  ctttaaatac ctatctctat caaattaaag ttgagttagt aaatgatggt ctaactattg 960
   52  atgtatacga agagccattt ggagttcgaa ccgttgaagt aaacgacggg aaattcctca 1020
   53  ttaataacaa accattttat tttaaagggt cggaaaaca cgaggatact ccaataaatg 1080
   54  gaagaggctt taatgaagca tcaaatgtaa tggattttaa tattttgaaa tggatcggtg 1140
   55  cgaattcctt tcggacggcg cactatcctt attctgaaga actgatgcgg ctcgcagatc 1200
   56  gtgaagggtt agtcgtcata gatgaaaccc cagcagttgg tgttcatttg aactttatgg 1260
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RAW SEQUENCE LISTING
PATENT APPLICATION: US/09/936,759

DATE: 12/16/2002
TIME: 15:17:04

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Output Set: N:\CRF4\12162002\I936759.raw

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58 ttgaacatca tcaagatgta ctgagagagc tggtttctcg tgataaaaac cacccctctg 1380
59 ttgtcatgtg gtcgattgca aatgaagcgg ctacggaaga agaaggcgct tatgaatact 1440
60 ttaagccatt agttgaatta acgaaagaat tagatccaca aaaacgccca gttaccattg 1500
61 ttttgttcgt aatggcgaca ccagaaacag ataaagtggc ggagttaatt gatgtgattg 1560
62 cattgaatcg atacaacggc tggtattttg atggggtga tcttgaagcc gcgaaagtcc 1620
63 accttcgtca ggaatttcat gcgtggaata aacgctgtcc aggaaaacct ataatgataa 1680
64 cagagtatgg ggctgatacc gtagctggtt ttcatgatat tgatccggtt atgtttacag 1740
65 aagagtatca ggttgaatat taccaagcaa atcatgtagt atttgatgaa tttgagaact 1800
66 ttgttggcga gcaggcctgg aattttgcag actttgctac aagccagggt gtcatgcgtg 1860
67 ttcaaggtaa caaaaaaggt gttttcacac gcgaccgcaa accaaaatta gcagcacatg 1920
68 ttttccgcga acgttggaca aacatcccgg atttcggtta taaaaattaa taaaaagctg 1980
69 gttctccaat aggaggccag cttttttaca tggatacaat ggttgtaaat taaaaaccct 2040
70 cttcattttt tatataaaaa tgaagagggt tttaattttt taaatgttat tacattttt 2100
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74 <211> LENGTH: 602
75 <212> TYPE: PRT
76 <213> ORGANISM: Staphylococcus sp.
78 <400> SEQUENCE: 2

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83              20                  25                  30
85  Trp Tyr Glu Ser Lys Leu Thr Asp Thr Ile Ser Met Ala Val Pro Ser
86          35                  40                  45
88  Ser Tyr Asn Asp Ile Gly Val Thr Lys Glu Ile Arg Asn His Ile Gly
89      50                  55                  60
91  Tyr Val Trp Tyr Glu Arg Glu Phe Thr Val Pro Ala Tyr Leu Lys Asp
92  65                  70                  75                  80
94  Gln Arg Ile Val Leu Arg Phe Gly Ser Ala Thr His Lys Ala Ile Val
95                  85                  90                  95
97  Tyr Val Asn Gly Glu Leu Val Val Glu His Lys Gly Gly Phe Leu Pro
98              100                 105                 110
100 Phe Glu Ala Glu Ile Asn Asn Ser Leu Arg Asp Gly Met Asn Arg Val
101             115                 120                 125
103 Thr Val Ala Val Asp Asn Ile Leu Asp Asp Ser Thr Leu Pro Val Gly
104         130                 135                 140
106 Leu Tyr Ser Glu Arg His Glu Glu Gly Leu Gly Lys Val Ile Arg Asn
107 145                 150                 155                 160
109 Lys Pro Asn Phe Asp Phe Phe Asn Tyr Ala Gly Leu His Arg Pro Val
110                 165                 170                 175
112 Lys Ile Tyr Thr Thr Pro Phe Thr Tyr Val Glu Asp Ile Ser Val Val
113             180                 185                 190
115 Thr Asp Phe Asn Gly Pro Thr Gly Thr Val Thr Tyr Thr Val Asp Phe
116         195                 200                 205
118 Gln Gly Lys Ala Glu Thr Val Lys Val Ser Val Val Asp Glu Glu Gly
119     210                 215                 220
121 Lys Val Val Ala Ser Thr Glu Gly Leu Ser Gly Asn Val Glu Ile Pro
122 225                 230                 235                 240
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124 Asn Val Ile Leu Trp Glu Pro Leu Asn Thr Tyr Leu Tyr Gln Ile Lys
125             245             250             255
127 Val Glu Leu Val Asn Asp Gly Leu Thr Ile Asp Val Tyr Glu Glu Pro
128             260             265             270
130 Phe Gly Val Arg Thr Val Glu Val Asn Asp Gly Lys Phe Leu Ile Asn
131         275             280             285
133 Asn Lys Pro Phe Tyr Phe Lys Gly Phe Gly Lys His Glu Asp Thr Pro
134     290             295             300
136 Ile Asn Gly Arg Gly Phe Asn Glu Ala Ser Asn Val Met Asp Phe Asn
137 305             310             315             320
139 Ile Leu Lys Trp Ile Gly Ala Asn Ser Phe Arg Thr Ala His Tyr Pro
140             325     .       330             335
142 Tyr Ser Glu Glu Leu Met Arg Leu Ala Asp Arg Glu Gly Leu Val Val
143             340             345             350
145 Ile Asp Glu Thr Pro Ala Val Gly Val His Leu Asn Phe Met Ala Thr
146         355             360             365
148 Thr Gly Leu Gly Glu Gly Ser Glu Arg Val Ser Thr Trp Glu Lys Ile
149         370             375             380
151 Arg Thr Phe Glu His His Gln Asp Val Leu Arg Glu Leu Val Ser Arg
152 385             390             395             400
154 Asp Lys Asn His Pro Ser Val Val Met Trp Ser Ile Ala Asn Glu Ala
155             405             410             415
157 Ala Thr Glu Glu Glu Gly Ala Tyr Glu Tyr Phe Lys Pro Leu Val Glu
158             420             425             430
160 Leu Thr Lys Glu Leu Asp Pro Gln Lys Arg Pro Val Thr Ile Val Leu
161         435             440             445
163 Phe Val Met Ala Thr Pro Glu Thr Asp Lys Val Ala Glu Leu Ile Asp
164         450             455             460
166 Val Ile Ala Leu Asn Arg Tyr Asn Gly Trp Tyr Phe Asp Gly Gly Asp
167 465             470             475             480
169 Leu Glu Ala Ala Lys Val His Leu Arg Gln Glu Phe His Ala Trp Asn
170             485             490             495
172 Lys Arg Cys Pro Gly Lys Pro Ile Met Ile Thr Glu Tyr Gly Ala Asp
173         500             505             510
175 Thr Val Ala Gly Phe His Asp Ile Asp Pro Val Met Phe Thr Glu Glu
176         515             520             525
178 Tyr Gln Val Glu Tyr Tyr Gln Ala Asn His Val Val Phe Asp Glu Phe
179     530             535             540
181 Glu Asn Phe Val Gly Glu Gln Ala Trp Asn Phe Ala Asp Phe Ala Thr
182 545             550             555             560
184 Ser Gln Gly Val Met Arg Val Gln Gly Asn Lys Lys Gly Val Phe Thr
185             565             570             575
187 Arg Asp Arg Lys Pro Lys Leu Ala Ala His Val Phe Arg Glu Arg Trp
188         580             585             590
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194 <210> SEQ ID NO: 3
195 <211> LENGTH: 372
196 <212> TYPE: PRT
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RAW SEQUENCE LISTING   DATE: 12/16/2002
PATENT APPLICATION: **US/09/936,759**   TIME: 15:17:04

Input Set : **A:\76518150.app**
Output Set: **N:\CRF4\12162002\I936759.raw**

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200 <223> OTHER INFORMATION: Description of Unknown Organism: Enterobacter sp.
201      or Salmonella sp.
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204 <221> NAME/KEY: MOD_RES
205 <222> LOCATION: (17)
206 <223> OTHER INFORMATION: Any amino acid
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209 <221> NAME/KEY: MOD_RES
210 <222> LOCATION: (103)
211 <223> OTHER INFORMATION: Any amino acid
213 <400> SEQUENCE: 3
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     218             20                  25                  30
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220 Val Gly Ala Asp Gly Asp Ile Arg Val Glu Leu Arg Asp Gly Gln Gln
221             35                  40                  45
223 Gln Ile Val Ala Gln Gly Leu Gly Ala Thr Gly Ile Phe Glu Leu Asp
224      50                  55                  60
226 Asn Pro His Leu Trp Glu Pro Gly Glu Gly Tyr Leu Tyr Glu Leu Arg
227  65                  70                  75                  80
229 Val Thr Cys Glu Ala Asn Gly Glu Cys Asp Glu Tyr Pro Val Arg Val
230                  85                  90                  95
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W--> 232 Gly Ile Arg Ser Ile Thr Xaa Lys Gly Glu Gln Phe Leu Ile Asn His
     233             100                 105                 110
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235 Lys Pro Phe Tyr Leu Thr Gly Phe Gly Arg His Glu Asp Ala Asp Phe
236          115                 120                 125
238 Arg Gly Lys Gly Phe Asp Pro Val Leu Met Val His Asp His Ala Leu
239      130                 135                 140
241 Met Asn Trp Ile Gly Ala Asn Ser Tyr Arg Thr Ser His Tyr Pro Tyr
242 145                 150                 155                 160
244 Ala Glu Lys Met Leu Asp Trp Ala Asp Glu His Val Ile Val Val Ile
245              165                 170                 175
247 Asn Glu Thr Ala Ala Gly Gly Phe Asn Thr Leu Ser Leu Gly Ile Thr
248          180                 185                 190
250 Phe Asp Ala Gly Glu Arg Pro Lys Glu Leu Tyr Ser Glu Glu Ala Ile
251          195                 200                 205
253 Asn Gly Glu Thr Ser Gln Gln Ala His Leu Gln Ala Ile Lys Glu Leu
254      210                 215                 220
256 Ile Ala Arg Asp Lys Asn His Pro Ser Val Val Cys Trp Ser Ile Ala
257 225                 230                 235                 240
259 Asn Glu Pro Asp Thr Arg Pro Asn Gly Ala Arg Glu Tyr Phe Ala Pro
260              245                 250                 255
262 Leu Ala Lys Ala Thr Arg Glu Leu Asp Pro Thr Arg Pro Ile Thr Cys
263          260                 265                 270
265 Val Asn Val Met Phe Cys Asp Ala Glu Ser Asp Thr Ile Thr Asp Leu
266      275                 280                 285
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268 Phe Asp Val Val Cys Leu Asn Arg Tyr Tyr Gly Trp Tyr Val Gln Ser
269     290                 295             300
271 Gly Asp Leu Glu Lys Ala Glu Gln Met Leu Glu Gln Glu Leu Leu Ala
272 305             310             315             320
274 Trp Gln Ser Lys Leu His Arg Pro Ile Ile Ile Thr Glu Tyr Gly Val
275             325             330             335
277 Asp Thr Leu Ala Gly Met Pro Ser Val Tyr Pro Asp Met Trp Ser Glu
278             340             345             350
280 Lys Tyr Gln Trp Lys Trp Leu Glu Met Tyr His Arg Val Phe Asp Arg
281         355             360             365
283 Gly Ser Val Cys
284     370
287 <210> SEQ ID NO: 4
288 <211> LENGTH: 376
289 <212> TYPE: PRT
290 <213> ORGANISM: Staphylococcus hominis
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293 <221> NAME/KEY: MOD_RES
294 <222> LOCATION: (209)
295 <223> OTHER INFORMATION: Any amino acid
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299 <222> LOCATION: (351)
300 <223> OTHER INFORMATION: Any amino acid
302 <400> SEQUENCE: 4
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307             20              25                  30
309 Leu Thr Ile Asp Val Tyr Glu Glu Pro Phe Gly Val Arg Thr Val Glu
310         35              40                  45
312 Val Asn Asp Gly Lys Phe Leu Ile Asn Asn Lys Pro Phe Tyr Phe Lys
313     50              55                  60
315 Gly Phe Gly Lys His Glu Asp Thr Pro Ile Asn Gly Arg Gly Phe Asn
316  65                 70                  75                  80
318 Glu Ala Ser Asn Val Met Asp Phe Asn Ile Leu Lys Trp Ile Gly Ala
319             85                  90                  95
321 Asn Ser Phe Arg Thr Ala His Tyr Pro Tyr Ser Glu Glu Leu Met Arg
322             100             105             110
324 Leu Ala Asp Arg Glu Gly Leu Val Val Ile Asp Glu Thr Pro Ala Val
325         115             120             125
327 Gly Val His Leu Asn Phe Met Ala Thr Thr Gly Leu Gly Glu Gly Ser
328     130             135             140
330 Glu Arg Val Ser Thr Trp Glu Lys Ile Arg Thr Phe Glu His His Gln
331 145             150             155             160
333 Asp Val Leu Arg Glu Leu Val Ser Arg Asp Lys Asn His Pro Ser Val
334             165             170             175
336 Val Met Trp Ser Ile Ala Asn Glu Ala Ala Thr Glu Glu Glu Gly Ala
337             180             185             190
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 12/16/2002
PATENT APPLICATION: **US/09/936,759**   TIME: 15:17:05

Input Set : **A:\76518150.app**
Output Set: **N:\CRF4\12162002\I936759.raw**

<u>Please Note:</u>
Use of n and/or Xaa have been detected in the Sequence Listing. Please review the
Sequence Listing to ensure that a corresponding explanation is presented in the <220>
to <223> fields of each sequence which presents at least one n or Xaa.

Seq#:3; Xaa Pos. 17,103
Seq#:4; Xaa Pos. 209,351
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Seq#:5; Xaa Pos. 135,140,153,158,162,169,172,174,178,181,186,190,194,195
Seq#:5; Xaa Pos. 197,198,199,200,207,208,210,213,228,305,358,367,373,379
Seq#:5; Xaa Pos. 392,396,408,413,415,423,436,437,438,439,448,450,457,466
Seq#:5; Xaa Pos. 467,468,469,473,483,489,490,495,497,501,510,515,516,517
Seq#:5; Xaa Pos. 522,529,535
Seq#:6; Xaa Pos. 61
Seq#:9; N Pos. 54,314,1126,1145,1162,1170,1178,1185,1192,1202,1277
Seq#:10; N Pos. 11,14,18,35,56,71,78,96,104,106,111,151,154,157,158,161,164
Seq#:10; N Pos. 165,167,168,171,181,192,195,197,198,203,220,233,237,245,252
Seq#:10; N Pos. 254,264,270,273,274,285,289,298,301,308,312,316,325,341,355
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Seq#:10; N Pos. 671,680,688,692,695,701,706,713,718,720
Seq#:11; N Pos. 1,12,16,21,25,27,29,34,35,37,46,47,48,55,58,59,63,64,70,78
Seq#:11; N Pos. 79,89,92,98,99,100,104,108,110,113,117,119,168,171,174,192
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Seq#:13; N Pos. 7,20
Seq#:14; N Pos. 181
Seq#:19; Xaa Pos. 209,351
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Seq#:22; Xaa Pos. 17,103
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RAW SEQUENCE LISTING ERROR SUMMARY   DATE: 12/16/2002
PATENT APPLICATION: **US/09/936,759**   TIME: 15:17:05

Input Set : **A:\76518150.app**
Output Set: **N:\CRF4\12162002\I936759.raw**

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Seq#:26; N Pos. 163,165,166,169,179,190,193,195,196,201,218,231,235,243,250
Seq#:26; N Pos. 252,262,268,271,272,283,287,296,299,306,310,314,323,339,353
Seq#:26; N Pos. 364,383,394,398,415,425,428,429,452,453,479,494,496,507,508
Seq#:26; N Pos. 513,531,566,582,586,601,612,619,621,623,629
Seq#:34; N Pos. 7
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VERIFICATION SUMMARY
PATENT APPLICATION: **US/09/936,759**

DATE: 12/16/2002
TIME: 15:17:05

Input Set : **A:\76518150.app**
Output Set: **N:\CRF4\12162002\I936759.raw**

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L:232 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:3 after pos.:96
L:342 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:208
L:366 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:4 after pos.:336
L:662 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:0
L:665 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:16
L:668 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:32
L:671 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:48
L:674 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:64
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L:680 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:96
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L:746 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:448
L:749 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:464
L:752 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:480
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L:758 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:512
L:761 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:5 after pos.:528
L:785 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:6 after pos.:48
L:1233 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:0
L:1238 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:300
L:1251 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1080
L:1252 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1140
L:1253 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1200
L:1254 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:9 after pos.:1260
L:1659 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:0
L:1660 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:60
L:1661 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:120
L:1662 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:180
L:1663 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:240
L:1664 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:300
L:1665 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:360
L:1666 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:420
```

VERIFICATION SUMMARY
PATENT APPLICATION: **US/09/936,759**

DATE: 12/16/2002
TIME: 15:17:05

Input Set : **A:\76518150.app**
Output Set: **N:\CRF4\12162002\I936759.raw**

```
L:1667 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:480
L:1668 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:540
L:1669 M:341 W: (46) "n" or "Xaa" used, for SEQ ID#:10 after pos.:600
```